

ARCHEOLOGY

Title: **Archeological Investigations in Yellowstone National Park-
Various Projects**

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Objectives: To salvage vertebrate carcasses for creating a comparative skeleton collection. This comparative collection will be used in the identification of archeologically derived faunal material.

Findings: Archeological sites along the Yellowstone River have produced the first evidence of fishing for the region. Faunal remains from various sites in the park indicate that all large mammals were present prior to Euroamerican contact. However, studies are ongoing to determine the prehistoric ecology and biogeography of these species.

Title: **Geochemical Investigations of Obsidian Source Material**

Objectives: Obsidian, a natural volcanic glass, was widely used by prehistoric groups throughout the Intermountain West to manufacture tools. Each obsidian source has its own unique chemical composition consisting of different amounts of various constituent elements. The concentration of these elements can be measured, providing a quantitative “signature” for each obsidian source. Once the geologic sources in the region been chemically characterized, obsidian artifacts can then be analyzed and their chemical profiles matched to known geologic sources. The spatial and temporal changes in obsidian artifact distributions provide archeologists with a powerful tool for reconstructing the lifeways, trading patterns, and settlement systems of the region’s aboriginal populations.

Findings: Prior to the beginning of this project, only three geochemical sources were documented as having been utilized by groups in Yellowstone. Our studies have identified at least 10 different sources of obsidian that were used to manufacture tools. Some of these sources are over 200 km from the park and provide a much more dynamic view prehistoric land use and toolstone procurement than previous studies. Our studies have included curated materials from the Mammoth Museum that were collected by visitors and park employees over the years, as well as from professional research projects.

Title: **Yellowstone Archeological Project**

Objectives: To collect various economic plant species for the development of a comparative collection that can be used as a reference for archeologically derived plant remains.

Findings: This is an ongoing project for comparative purposes. The specimens collected were used in comparing archeological materials from prehistoric cooking hearths along the Yellowstone River and Yellowstone Lake between 1991 and 1994. No further work has been conducted.

Title: **Archeological Research along the Yellowstone River and
Miscellaneous Archeological Research in Yellowstone
National Park**

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Objectives: Investigations into the prehistoric cultural history and adaptations in Yellowstone National Park will be combined with those in the surrounding Greater Yellowstone Area to gain a larger and more accurate view of early times in the region. This broad project will combine results from compliance driven investigations with research investigations in a multi-year study.

Data to be collected include radiocarbon and obsidian hydration dates, diagnostic artifacts including projectile points and pottery, floral and faunal materials, pollen, and chemical sourcing of obsidians. All collections will be stored at the museum in Mammoth Hot Springs.

About half the work was compliance driven for ground disturbing projects. These included inventories along existing highways for the proposed Federal Highway Administration rehabilitation of the road system. Other compliance projects were for backcountry trails rehabilitation. Road segments included Mammoth to Gardiner – both the existing road and high road, and the east side of the highway between Canyon and Fishing Bridge. Inventoried areas on backcountry trails were spread broadly around the park including Fan Creek, Bighorn Creek, Big Game Ridge, Fox Park, Bliss Pass, and Bunsen Peak. Research driven inventory covered the Yellowstone River between Fishing Bridge and Canyon Village.

Findings: Five sites tested during 1997 were severely damaged by flooding in the two prior years. It is hypothesized that sites in this part of the Yellowstone River were winter camps and that people could

have hunted bighorn sheep in the vicinity. Four Yellowstone Institute classes and other volunteers greatly assisted with the fieldwork.

A buried, multi-component site along the Gardner River was tested for the National Register under the Federal Highways Program. The goal of this particular work was to determine what part of the site was within the current highway right-of-way. The core of the site appears to be out of the right-of-way. However, cultural deposits and features (hearths) do occur within the area of particular interest.

A site was studied on an intermittent unnamed tributary of the Yellowstone River where the drainage is undergoing severe downcutting and sidewall cutting, resulting in exposure of and damage to prehistoric campsites on both sides. A Pelican Lake projectile point collected from the surface dates from c. A.D. 200-1000 B.C. The prehistoric component is assumed to represent the same or similar peoples camping in this location during a short period of time. The cultural material includes chipped stone and flaking debris from several raw materials, discrete fire-cracked rock concentrations filled with charcoal, and a 5-10 cm. ashy soil horizon. Some archeological large mammal and bison bone was collected. The horizontal extent of these cultural remains are away from the drainage where they are still covered with slopewash.

Another site located on a small drainage where colluvium had buried a multi-component site was reported by Jim Sweeney, who observed roasting pits eroding into the Yellowstone River. We salvaged three roasting pits and then gathered data from the small area of remaining site.

At another site, deeply buried, fire-cracked rock unit was sampled about 10 m east of an earlier test by the Midwest Archeological Center (Ken Cannon), but no diagnostic material was found.

The largest and most important site studied this year extends along bank of the Yellowstone River for more than 100 meters. There are three buried components: The highest (youngest), dated at 630+/-70 BP (Beta-108594) [Unit 1] and 930+/-60 BP [Unit 9], contained prehistoric pottery that was identified as Intermountain Ware, which is believed to represent prehistoric Shoshone people and is the second find of this kind of pottery in the park. (The other Intermountain Ware was found on Yellowstone Lake.) The second component represents Pelican Lake culture and the third did not have any diagnostic artifacts. Results of the faunal identifications may show which animals people were eating and possibly which season the camp was used. Data from obsidian sourcing, pollen, charcoal identification, macrofloral analyses, and more radiocarbon dates are not yet available but will be incorporated into the annual descriptive report for the 1997 field season.

Under the National Register testing, it was determined that these sites represented tool manufacturing, with obsidian composing more than 99% of the raw material. For sites close to Obsidian Cliff, the Obsidian Cliff plateau is the most likely source of raw material; for sites farther away, it is likely that at least some obsidian was obtained in the form of cobbles from the glacial and river gravels. All sites appeared to have good integrity and are recommended as National Register eligible.

For the Yellowstone River and some of its tributaries, 1,308 acres were intensively inventoried using a

subjectively selected sample of landforms. Documentation was made of 33 new sites and 13 previously recorded sites that contain small to large lithic scatters, often with fire-cracked rock features; some contain tipi rings or stone circles. The sites yielded debitage, projectile points, scrapers, bifaces, drills, and other artifacts. Faunal material, especially bison remains, are fairly common on some sites. Unauthorized collection of artifacts was documented on one site and suspected on another.

In 1998, one site was tested in the Black Canyon of the Yellowstone upstream from Gardiner. Testing revealed five components sealed by overbank flood deposits. This site is much like the one across the river in that it is of very high value with intact features, good stratigraphy, and excellent faunal preservation. Macrofloral samples were sent for analysis but the results have not yet been received. An exciting new development in 1998 was the recognition of a new source for archeological obsidian. This is on the east shore of Yellowstone Lake. After we recognized this obsidian was used by early people for tools, we went back to obsidian specimens from unknown sources. There we were able to identify about half of the 17 unknowns from a site on the north shore of Yellowstone Lake as coming from the east shore obsidian source. It would be important to identify boundaries and exposures for the east shore obsidian source. For all 1998 fieldwork, 296 new prehistoric sites were recorded and 26 previously known sites were documented to current standards. Collected materials will be stored at the museum in Mammoth Hot Springs.

Title: **Parkwide Road Improvement Inventory and Testing**

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Objectives: In 1997, Class III cultural resource inventory of portions of the Grand Loop Road south of Bridge Bay, test excavations, and additional archaeological investigations at 10 prehistoric sites throughout the park. In 1998, archaeological test excavations at prehistoric and historic sites located in the northeastern corner of Yellowstone National Park and Canyon to Lake Junction Road as well as data recovery and mitigation along the Madison to Norris Road.

Findings: In 1997, buried cultural materials were found at all 10 sites. These consisted of chipped stone tools and debitage, mostly made from obsidian. Of the 31 obsidian artifacts that were submitted for source analysis, 30 were identified as coming from Obsidian Cliff. The other came from Lava Creek welded tuff, also a local source.

One of the sites contained three rock cairns that were test excavated. Except for a few flakes, no other cultural materials were found in the cairns. Seven other sites, located to the north and south of Obsidian Cliff, appear to be lithic workshops for the manufacture of obsidian tools. A site situated in Lamar Canyon that consists of a sparse scatter of chipped tools and debitage (mostly local cherts) while the last investigated site was found to be an extension of the Fishing Bridge site, on the north side of Yellowstone Lake.

Our investigation found diagnostic artifacts representing temporal periods ranging from late Paleoindian to Late Prehistoric. However, intact buried cultural levels could not be defined, probably due to past bioturbation. Most of the cultural materials were located within the upper 10-30 cm. No features or faunal remains were located except for a few intrusive rodent bones. Site eligibility and significance is still being evaluated, but most of the investigated sites will probably be considered ineligible because of their lack of integrity.

During 1998, in the northeastern corner of Yellowstone, test excavations were conducted at three prehistoric sites. Buried cultural materials were recovered from all three sites but buried cultural levels were only encountered at two sites. The buried level at one site consisted of a small (ca. less than 5 m diameter) concentration of debitage and a few chipped stone tools and burned and unburned faunal remains. The faunal remains were identified as elk, one of which provided an AMS radiocarbon date of 80+/-50 B.P. Calibration of this date indicates a probable Historic/ Protohistoric occupation. Another site yielded a Late Archaic occupation, dated at 1940+/-50 B.P., that contained a large corner-notched hafted knife, pestle, end scraper, other chipped stone flaking debris, and a few faunal remains associated with a small basin-shaped hearth feature and burned rock level. Two of these sites are eligible for listing on the National Register of Historic Places.

During 1998, from Canyon to Lake Junction, 13 archeological sites were recorded during the cultural resource inventory, five of which were previously recorded. All of these were prehistoric scatter of chipped stone tools and flaking debris, except for a site near the Mud Volcano which also contained the remains of a collapsed historic cabin and the Grand Loop Road (an historic district). Abandoned segments of this road were identified during the inventory. Another aspect of the project included test excavations at a site located south of Canyon. Buried stratified prehistoric occupations were identified, one probable Late Prehistoric/Late Archaic age component, and another lower component that is radiocarbon dated as Middle Archaic in age (ca. 4380 years B.P.). Large quantities of obsidian debitage and chipped stone tools were identified, suggesting a campsite function to the site.

Along the Madison to Norris road, excavations were conducted which contained historic and prehistoric components, located on a relatively flat terrace along the Gibbon River. The prehistoric component contained obsidian debitage, but was undated. The historic component is the main focus of the excavation, and documents the historic remains of a 1928 road construction camp. The excavations also revealed cultural materials associated with an earlier Shaw and Powell lunch station during the early 1900s and a later 1931 road construction camp. Historic materials included bottles, cans, ceramics, bone, and other items.

Artifacts located during these investigations were collected and will be curated at the park's Branch of Cultural Resources in Mammoth.

Title: **Analysis of Obsidian in the Northwestern USA**

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Objectives: The major objective of this research is to establish a geochemical database of obsidian sources in the northwestern USA, including sources in Yellowstone National Park and adjoining areas. Samples of obsidian from various source areas are collected and analyzed by two analytical techniques (neutron activation analysis and x-ray fluorescence analysis) to establish the database. In addition, the source samples are being collected from primary outcrops and secondary deposits to establish the true availability of each obsidian source group to prehistoric peoples. The geographic coordinates of each sample are being entered into the database along with the chemical analysis information.

Findings: To date, three major homogeneous geochemical sources have been fully characterized in Yellowstone National Park - Obsidian Cliff, Cougar Creek, and Gibbon River - following a collection visit to Yellowstone National Park in September 1998. Two other geochemical groups on the Gibbon River are also known. Samples from one of the Gibbon River sources were collected in 1998 and proven to be of poor quality and probably of little importance archeologically. The Dunraven Pass samples were not collected by these researchers but given to one of us by a collector. Unfortunately, we were unaware of this outcrop during our visit to Yellowstone in 1998. We do not know if Dunraven Pass obsidian was important archeologically and will keep this question in mind as we continue our research.

Title: **A Petrological and Geochemical Analysis of the Tanker Curve Obsidian**

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Objectives: To Correlate the Tanker Curve obsidian deposit, which is of a secondary origin, with its parent body.

Findings: The study is finished as of December 1997. Tanker Curve most closely correlates with the Gibbons River obsidian deposit.

Title: **Historic Site Investigations: FHWA Projects**

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Objectives: Topics of archival research during 1997 included Fountain Soldier Station, Hobart Hotel, Wiley Swan Lake Camp, Lamar Valley Buffalo Ranch, Soda Butte Soldier Station, and Tower Soldier Station. Sources included: the National Archives in Washington, D.C. and College Park, Maryland; Yellowstone National Park archives in Mammoth, Wyoming; Special Collections at Renne Library, Montana State University, Bozeman; the Livingston Public Library, Livingston, Montana; and the Montana Historical Society in Helena.

Archaeological testing in 1997 was limited to the Soda Butte Soldier Station, where a magnetic survey was conducted over 0.4 acres of the site to test the subsurface archeological resources within a 20 m x 80 m area centered in the site previously surface collected. In addition to being non-intrusive, the magnetic survey provides electronic data and hard copy maps that can be used in further archeological research. The Tower Soldier Station was subject to archaeological testing in 1998.

Findings: The 1997 magnetic survey identified sites of concentrated sheet refuse located on the historic surface of the site and anomalies within the site's core, of which three areas were tested further by limited excavations. As expected based on the magnetic data, the excavations showed that one area was a building site, one was a privy location, and the third a trash deposit. The subsurface archeological

resources have good integrity and offer opportunities for further research and interpretation of military occupation of the site. It is also known that once the military departed, the site was used as a ranger station.

During the fall of 1998 the Museum's crew visited the Tower Soldier Station site and conducted three operations. The first was a systematic intensive surface collection of an area within which was found the sites of several buildings believed to be associated with the Tower Soldier Station. The surface collection was followed by a geophysical survey of the same area using proton magnetometers. Finally, the crew completed four archaeological test excavations, the locations of which were based on observations of depressions or, in one case, the results of the geophysical survey. A total of 2,720 artifacts were recovered during the course of the surface collection. This material has been processed and computerized. The report is presently being prepared for the Tower Soldier Station project.

Title: **Obsidian Studies: XRF Characterization of Obsidian Sources
of Yellowstone National Park**

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Objectives: Characterizing obsidian sources for chemical composition using XRF to match prehistoric artifacts to their obsidian source. Yellowstone obsidian has ended up in prehistoric sites in Iowa, Colorado, Wyoming, and several other states.

Findings: The main Yellowstone source was Obsidian Cliff, and prehistoric obsidian artifacts ended up in many states. The amount that was procured directly and the amount traded down the line has not been determined, and this determination of kinds of contact is active.